

ECE110H1S – Electrical Fundamentals – 2009

The lecture outline below is only approximate. The actual topics and lecture schedule may vary.

Lec.	Week of	Topics	Sections	Suggested Problems
1	Jan. 5	Course introduction. Review of Vectors. Electric charges. Conductors and Insulators.	Halliday/Resnick 21-1 to 21-3	
2		Coulomb's law.	21-4	2, 3, 8, 16, 20, 21
3	Jan. 12	Electric field. Electric field lines. Electric field of a point charge. Force on a point charge.	22-2 to 22-4 22-8	3, 6, 11, 13, 42, 67
4		Electric potential.	24-2 to 24-7	3, 5, 8, 9, 12, 16
5		Capacitance. Parallel plate capacitor. Capacitors in Parallel and in series. Energy stored in capacitors.	25-2 to 25-6	5, 8, 9, 17, 36, 45
6	Jan. 19	Magnetic field. Magnetic field lines. Magnetic force on a current carrying wire.	28-2, 28-3, 28-8	1, 5, 41, 42, 43
7		Magnetic field due to a current. Force between two parallel currents.	29-2, 29-3	3, 7, 9, 19, 36, 37
8		Faraday's law	30-2, 30-3, 30-5	1, 2, 4, 11, 13
9	Jan. 26	Inductance. Inductors in parallel and in series. Energy stored in inductors.	30-7, 30-8, 30-10	40, 41, 45, 46, 49
10		Review on electricity and magnetism.		
11		Basic circuit elements. Ohm's law.	Irwin/Nelms 1.1 to 1.3, 2.1	1.3, 8, 26, 31, 37
12	Feb. 2	Kirchhoff's laws	2.2	2.3, 7, 13, 21, 24
13		Resistors in series and in parallel. Voltage and current division.	2.3 to 2.6	2.29, 32, 35, 40, 45, 2.51, 53, 67, 79
14		Nodal analysis.	3.1	3.5, 11, 16, 18, 23
15	Feb. 9	More on nodal analysis.	3.1	3.25, 32, 36, 39
16		Mesh (loop) analysis.	3.2	3.46, 51, 56, 61, 64
17		More on mesh (loop) analysis.	3.2	3.66, 68, 75, 78, 89
	Feb. 16	READING WEEK		
18	Feb. 23	Operational amplifier circuits.	4.1, 4.2	4.12, 18, 22, 25
19		More on operational amplifier circuits.	4.3, 4.4	4.30, 35, 4FE-1, -2
20		Equivalent circuits. Superposition.	5.1, 5.2	5.1, 5, 7, 11, 13
21	Mar. 2	More on superposition.	5.2	5.14, 16, 18, 19
22		Thevenin's and Norton's theorems.	5.3	5.23, 24, 28, 33
23		More on Thevenin's and Norton theorems.	5.3	5.44, 46, 55, 76, 77, 80
24	Mar. 9	Maximum power transfer.	5.4	5.96, 98, 101
25		Capacitors and Inductors as circuit elements	6.1 to 6.3	6.12, 17, 26, 57, 62, 67
26		First order circuits.	7.2	7.15, 16, 17, 19
27	Mar. 16	More on first order circuits.	7.2	7.23, 27, 31, 34, 41
28		Sinusoids.	8.1	8.1, 2, 3, 5
29		Complex numbers.	App. pp835-839	A.1 - 4 (on-line)
30	Mar. 23	Phasors.	8.2, 8.3	B.1 - 4 (on-line)
31		Impedance.	8.4 to 8.6	8.6, 7, 8, 9, 12, 16, 19
32		AC steady-state analysis.	8.7, 8.8	8.29, 30, 44, 50
33	Mar. 30	More on AC circuits.	8.7, 8.8	8.51, 53, 58, 59
34		Frequency response.	12.1	C.1 - 4 (on-line)
35		More on frequency response	12.1	D.1 - 4 (on-line)
36	Apr. 6	Average power. RMS value. Power factor.	9.2, 9.4, 9.5	9.2, 9, 10, 56, 63
37		Maximum average power transfer.	9.3	9.28, 29, 30, 32
38		Course review		
39	Apr. 13	Course review		